PEACE/WILLISTON
FISH & WILDLIFE
COMPENSATION
PROGRAM

BC hydro

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A Reconnaissance Survey Of Heather Lake

A. R. McLean
1989

PWFWCP Report No. 90

105-02841/

The Peace/Williston Fish & Wildlife Compensation Program is a cooperative venture of BC Hydro and the provincial fish and wildlife management agencies, supported by funding from BC Hydro. The Program was established to enhance and protect fish and wildlife resources affected by the construction of the W.A.C. Bennett and Peace Canyon dams on the Peace River, and the subsequent creation of the Williston and Dinosaur Reservoirs.

Peace/Williston Fish and Wildlife Compensation Program, 1011 Fourth Ave. 3rd Floor, Prince George B.C. V2L 3H9

Website: *www.bchydro.bc.ca/environment/initiatives/pwcp/*

This report has been approved by the Peace/Williston Fish and Wildlife Compensation Program Fish Technical Committee.

Citation: A. R. McLean. 1989. A reconnaissance survey of Heather Lake. Peace/Williston Fish and Wildlife Compensation Program, Report No. 90. 21pp plus appendices.

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A RECONNAISSANCE SURVEY OF

HEATHER LAKE

WATERSHED: Parsnip River

DATE OF SURVEY: June 13th & 14th. 1989

FIELD CREW LEADER: D.A. Jesson

FIELD ASSISTANT: M.G. Labach

PEACE FISHERIES COMPENSATION PROGRAM

B. C. HYDRO

ENVIRONMENTAL RESOURCES

and

B.C. ENVIRONMENT

FISH AND WILDLIFE BRANCH

REPORT PREPARED BY: A.R. McLean

RELEASED BY: _____

D.H.G. Ableson, Regional Fisheries Biologist

Lake: **HEATHER**

SYSTEM NAME: Unnamed C.

A.S.A.P. REFERENCE NO.: -

SYSTEM NO: --

DATA ON FILE FOR THIS SURVEY

Location	X	Dissolved O2/Temp. Profiles	--
Physical Data	--	Winter Dissolved 02/Temp. Profiles	--
Bench Mark	--	Netting Record	X
Terrain Features	X	Lake Catch Summary	X
Access	X	Individual Fish Data	X
Resorts and Campsites	X	Fish Preserved	--
Other Developments	X	Stomach Analysis	X
Obstructions and Pollutions	X	Scale Reading	X
Special Restrictions	X	Location of Inventory Sites	X
Aquatic Plants	X	Photograph Directory	X
Wildlife Observations	X	Appendices:	
Miscellaneous Comments	X	A: Water Chemistry Analysis	--
Lake Drainage	X	B: Tributary Stream Data	X
Fisheries Management Comments	X	Bathymetric Map Reduction	--
History of Previous Surveys	X	Bathymetric Map	--
Water Chemistry Summary	--		

LOCATION

Location: 20 km northwest of Mackenzie
Elevation: 693 m +/-
Latitude/Longitude: 55°30'00":123°15'11" U.T.M.: 10.4840.61502
Management Unit: 7-30 N.T.S. Map No.: 93-0/6,0/11

Drainage: Outlet C.-->Williston Reservoir (Parsnip Reach)-->Peace R.

PHYSICAL DATA

See Bustard and Janssen, 1970.

BENCHMARK

See Bustard and Janssen, 1970.

Lake: HEATHER

TERRAIN FEATURES

Immediate Shoreline:

See Bustard and Janssen, 1970.

Surrounding Country:

Heather Lake is set in a valley with the Rocky Mountain Foothills located along the east shore and low sloping terrain along the west, north and south shores. The forest cover is predominately coniferous.

Also see Bustard and Janssen, 1970.

Lake: **HEATHER**

ACCESS

Directions:

From the junction of Centennial Blvd. and Mackenzie Blvd., travel north on Mackenzie Blvd. (Hwy. 39) keeping right at 9.4 km and 10.4 km. Turn left at 21.5 km and proceed 0.6 km to water's edge.

The total distance from Mackenzie to Heather Lake is 22.1 km.

Road Type and Conditions:

Mackenzie Blvd. (Hwy. 39) is a paved 2 lane highway which changes to a gravel road north of town. At this point, the road is a badly rutted, 2 lane, gravel logging road. The lake access road is a one lane rough gravel road.

Restrictions:

None.

RESORTS AND CAMPSITES

A B.C. Forest Service Recreation site is located on the southeast shore at the access point. The site has 3 picnic tables and a large parking area.

OTHER DEVELOPMENTS

None.

Lake: HEATHER

OBSTRUCTIONS AND POLLUTIONS

Beaver dams located on the northerly inlet, 270 m and 870 m upstream respectively from the lake, are barriers to upstream fish passage at present water flows.

SPECIAL RESTRICTIONS

Heather Lake is located within Ecological Reserve #87, as identified on NTS mapsheet 93-0/11, 0/6.

AQUATIC PLANTS

Potamogeton sp.
Nuphar sp.
Myriophyllum sp.
Equisetum sp.
Ranuculus SP.

WILDLIFE OBSERVATIONS

Numerous beaver lodges.
1 muskrat
Numerous species of waterfowl.

MISCELLANEOUS COMMENTS

1 lake Whitefish observed floating dead near the outlet.
Approx. 100 coarse suckers were noted near the outlet creek.
2 suckers were observed in the outlet, approx. 50 m downstream of the lake.
Numerous coarse fish were observed in the inlet.

Lake: HEATHER

LAKE DRAINAGE

General:

Heather Lake has one inlet and one outlet. The outlet flows southwest 2.5 km and discharges into the Parsnip Reach of Williston Reservoir.

Major Systems:

None.

Minor Systems:

Unnamed C. - inlet

The inlet is approx. 350 m in length and drains into the north end of Heather Lake. At approximately 260 m upstream from the lake the creek had an average wetted width of 7.5 m, an average depth of 0.45 m, a velocity of 0.09 m/sec and a field gradient just over 0.0%. A beaver dam (approx. 0.7 m in height) was located approx. 270 m upstream from the lake. The inlet was chocked with Ranuculus sp. and water grasses. The substrate was 100% organics offering no salmonid spawning habitat. A small lake (unnamed lake #1) is located approx. 350 m upstream from Heather Lake. A water depth of 7.0 m was measured near the middle of the lake. A second lake (Dina Lake (#4) was located approx. 960 m upstream from Heather Lake. The creek connecting "unnamed Lake #1" to Dina Lake #4 had three beaver dams present, at 840 m, 870 m, and 960 m upstream from Heather Lake. The latter two dams were 0.4 m and 0.8 m in height. A water depth of 19.4 m was measured near the middle of Dina Lake (#4).

Lake: **HEATHER**

Minor Systems: (continued)

Unnamed C. - outlet

The outlet creek drains Heather Lake from the southeast shore. The creek had an average wetted width of 1.64 m, average depth of 22 cm, a water temperature of 20°C and a field gradient of 1%, approximately 50 m downstream from the lake. This section had moderate rearing habitat (undercut banks, LOD) and the occasional patch of spawning gravel, however a high fines content was apparent. The creek had an average wetted width of 4.4 m, average depth of 6 cm, and a field gradient of 2.5%, approx. 150 m downstream from the lake. Moderate to good spawning and moderate rearing (pools, LOD, undercut banks) habitat was noted.

See point sample cards for additional information.

Lake: **HEATHER**

FISHERIES MANAGEMENT COMMENTS

Heather Lake supports a population of rainbow trout, bull trout, mountain Whitefish, lake Whitefish and assorted coarse fish species. A 24 hour net set and two minnow traps produced 3 rainbow trout, 5 bull trout, 17 lake Whitefish, 36 mountain Whitefish and 6 different coarse fish species, including northern Squawfish. The inlet has a complete organic substrate, thereby affording no spawning habitat. The beaver dams located 270 m and 870 m upstream from the lake are barriers to upstream fish passage at present water flows. The outlet creek has fair to good spawning habitat and moderate rearing habitat. Heather Lake was first stocked with rainbow trout by the Province in 1972 (20,000) and subsequently in 1981 (10,000) and 1983 (10,000). Stocking has since been curtailed, once netting results (1984) revealed the rainbow trout were not surviving well in Heather Lake. This is likely due to competition with other fish species and predation by northern Squawfish and bull trout.

This lake was primarily investigated for the potential of lake rehabilitation. However, due to the complexity of the system, a rehabilitation would be very costly and a total kill highly unlikely. Stocking this lake with Blackwater rainbow trout could be considered, as research indicates this strain of rainbow trout have a history of doing well in a coarse fish environment.

Post Survey Note: Heather Lake was stocked May 4, 1992 by mistake, with 5,000 rainbow trout (Premier Lake Stock). Average weight was 6.6 grams.

HISTORY OF PREVIOUS SURVEYS

Lake Surveys:

Little, B., 1984. A Stock Assessment of Heather Lake (Data sheets).
Bustard and Janssen, 1970. A Reconnaissance Survey of Heather Lake (Data sheets).

Data sheets on file at B.C. Environment, Prince George.

Other Related Surveys:

None.

Lake: **HEATHER**

NETTING RECORD

Mesh sizes experimental order: 25, 76, 51, 89, 38, 64 mm

NETTING SITE #1

Type:	Sinking monofilament		
Date Set:	June 13, 1989	Time:	1320 hrs
Date Lifted:	June 14, 1989	Time:	1045 hrs
Net Dimensions:	Length: 91.4 m	Depth:	2.4 m
Shallow End Mesh Size:	25 mm	Depth:	1.5 m
		Substrate:	vegetation/ organics/fines
Deep End Mesh Size:	64 mm	Depth:	1.5 m
		Substrate:	

Lake: HEATHER

LAKE CATCH SUMMARY

SPECIES	NET SITE NO.				ANGLED	OTHER	TOTAL	NUMBER SAMPLED	NUMBER PRESERVED	SIZE RANGE (cm)
	1	2	3	4						
rainbow trout	3						3	3		28.1 - 32.0
bull trout	5						5	5		31.1 -41.5
lake whitefish	17						17	17		26.0 - 28.5
mountain whitefish	36						36	36		22.0-39.9
coarse sucker	37						37			30.0 - 37.5
longnose sucker	40						40			22.0 - 36.0
Northern Squawfish	40						40			11.0 - 35.5
redside shiner	2						2			9.2
peamouth chub	4						4			11.0 - 14.5

Comments:

Black spot disease noted on some northern squawfish.

Minnow Traps:

BAIT: Sardines

#	HOURS	DEPTH (m)	SUBSTRATE	SPECIES	SIZE RANGE (cm)
1	23.00	0.5	organics	13 slimy sculpins 5 redside shiners	?
2	23.25	?	?	1 northern squawfish 15 redside shiners	?

Comments:

Black spot disease noted on some redside shiners.

Lake: HEATHER

INDIVIDUAL RSH DATA

Date Captured: June 14, 1989

Method of Capture: Sinking monofilament gill net.

M - Male
F - Female
? - Not Obvious

IMM - Immature
MG - Maturing
MT - Mature
GV - Gravid
SP - Spent
? - Not Obvious

EG - Egg
FR - Fin Ray
HD - Head
ML - Milt
OT - Otolith

SC - Scale
ST - Stomach
TG - Fish Tag
WF - Whole Fish

SPECIES mountain Whitefish	Fork Length (cm)	Weight (grams)	Sex	Gonadal Maturity	Sample Type	Age (yr)	Stomach Contents				COMMENTS
							Plankton	Insects	Fish	Other	
mountain Whitefish	24.8	150			SC	4					
mountain Whitefish	25.0	165			SC	4					
mountain Whitefish	25.5	170	M	MG	SC	5	plankton			tadpoles	
mountain Whitefish	25.5	150	F	MG	SC	3	plankton			tadpoles	
mountain Whitefish	25.7	180			SC	4					
mountain Whitefish	25.7	180			SC	5					
mountain Whitefish	25.8	180			SC	5					
mountain Whitefish	26.5	180	F	MG	SC	5					stomach empty
mountain Whitefish	27.0	200	F	MG	SC	5					stomach empty
mountain Whitefish	27.4	200			SC	5					
mountain Whitefish	27.5	220	F	MG	SC	4				detritus	
mountain Whitefish	27.6	0245	F	MG	SC	5	plankton				
mountain Whitefish	28.2	250			SC	6					
mountain Whitefish	29.0	270			SC	7					
mountain Whitefish	39.9	745	F	MG	SC	8			Sculpin	aquatic weeds (Ranuculus)	
lake Whitefish	26.0	190			SC	3+					
lake Whitefish	26.0	180	F	MG	SC	4+	plankton				tapeworm cysts & nodules
lake Whitefish	26.0	190	F	MG	SC	4					tapeworm cysts; empty stomach
lake Whitefish	26.5	190			SC	3					
lake Whitefish	26.5	180	F	MG	SC	4+	plankton				tapeworm cysts
lake Whitefish	27.5	190	F	MG	SC	4	plankton				tapeworm cysts & nodules

Lake: **HEATHER**

INDIVIDUAL FISH DATA

Date Captured: June 14, 1989

Method of Capture: Sinking monofilament gill net.

M - Male, F - Female, ? - Not Obvious
IMM - Immature, MG - Maturing, MT - Mature, GV - Gravid, SP - Spent, ? - Not Obvious
EG - Egg, FR - Fin Ray, HD - Head, ML - Milt, OT - Otolith
SC - Scale, ST - Stomach, TG - Fish Tag, WF - Whole Fish

SPECIES	Fork Length (cm)	Weight (grams)	Sex	Gonadal Maturity	Sample Type	Age (yr)	Stomach Contents				COMMENTS
mountain Whitefish							Plankton	Insects	Fish	Other	
lake Whitefish	27	180	F	MG	SC	4	plankton				lg tapeworm cysts & nodules
lake Whitefish	27.4	220	F	MG	SC	4+	plankton				tapeworm cysts; plankton
lake Whitefish	27.5	255			SC	4+					
lake Whitefish	27.5	240			sc	4					tapeworm cysts & nodules
lake Whitefish	27.5	240	M	MG	SC	4	plankton				tapeworm cysts & nodules
lake Whitefish	27.5	190	F	MG	sc	4	plankton				tapeworm cysts & nodules
lake Whitefish	28.2	240	M	MG	sc	5	plankton				tapeworm cysts & nodules
lake Whitefish	28.4	230		MG	sc	5					
lake Whitefish	28.5	265	M	MG	sc	5					tapeworm cysts & nodules; stomach empty
bull trout	34	295	M	MG	OT	7+			unidentified fish		
bull trout	35.9	460	M	MG	OT	7+			unidentified fish		tapeworm in stomach
bull trout	36.2	500	F	MG	OT	9+					stomach empty
bull trout	39.2	670	M	MG	OT	10+			unidentified fish		
bull trout	41.5	800			OT	10+			lake white fish		
rainbow trout	28.1	240	F	MG	sc	4		beetles, terrestrial and flying insects			
rainbow trout	30.0	290	F	MG	SC	4		terrestrial and insects		detritus	
rainbow trout	32.0	295	F	MG	SC	4		terrestrial flying insects			not preferred scale sample

AGE DETERMINATION COMPLETED BY:
Margaret McDonald Box 243, Midway, B.C., VOH 1 MO

Lake: HEATHER

INDIVIDUAL FISH DATA

Date Captured: June 14, 1989

M - Male
F - Female
? - Not Obvious

IMM - Immature
MG - Maturing
MT - Mature
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SC - Scale
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TG - Fish Tag
WF - Whole Fish

Method of Capture: Sinking monofilament gill net.

SPECIES	Fork Length (cm)	Weight (grams)	Sex	Gonadal Maturity	Sample Type	Age (yr)	Stomach Contents				COMMENTS
							Plankton	Insects	Fish	Other	
LENGTH AND WEIGHT DATA ONLY ON THE FOLLOWING:											
mountain Whitefish	22.0	120									
mountain Whitefish	23.5	150									
mountain Whitefish	24.2	155									
mountain Whitefish	24.2	150									
mountain Whitefish	24.2	160									
mountain Whitefish	24.3	140									
mountain Whitefish	24.5	165									
mountain Whitefish	24.5	160									
mountain Whitefish	24.7	159									
mountain Whitefish	25.1	150									
mountain Whitefish	25.3	175									
mountain Whitefish	25.4	160									

Lake: **HEATHER**

INDIVIDUAL FISH DATA

Date Captured: June 14, 1989

Method of Capture: Sinking monofilament gill net.

M - Male
F - Female
? - Not Obvious

IMM - Immature
MG - Maturing
MT - Mature
GV - Gravid
SP - Spent
? - Not Obvious

EG - Egg
FR - Fin Ray
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ML - Milt
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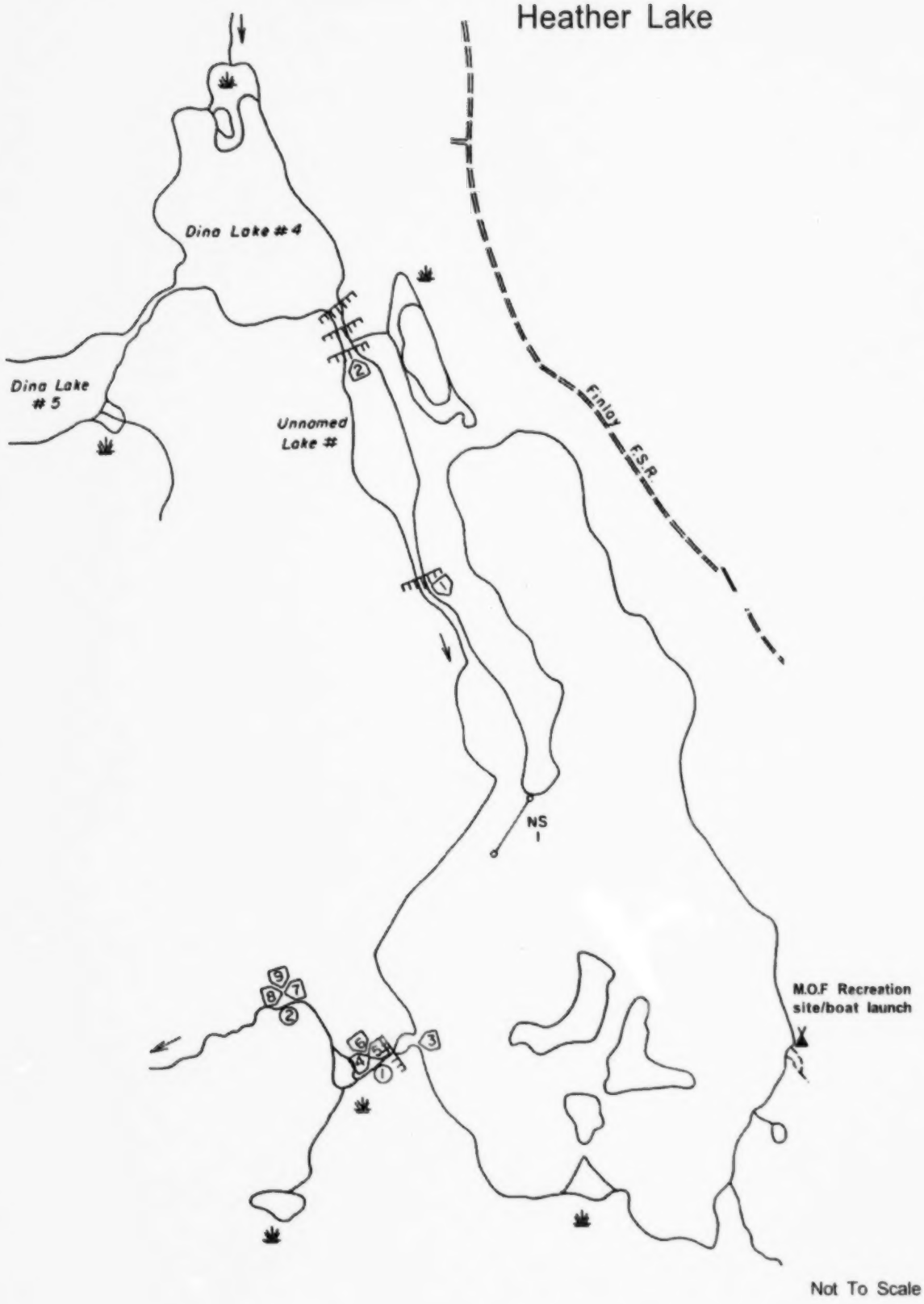
SC - Scale
ST - Stomach
TG - Fish Tag
WF - Whole Fish

SPECIES	Fork Length (cm)	Weight (grams)	Sex	Gonadal Maturity	Sample Type	Age (yr)	Stomach Contents				COMMENTS
							Plankton	Insects	Fish	Other	
LENGTH AND WEIGHT DATA ONLY ON THE FOLLOWING:											
mountain Whitefish	25.5	170									
mountain Whitefish	25.9	170									
mountain Whitefish	26.0	170									
mountain Whitefish	26.0	180									
mountain Whitefish	26.4	190									
mountain Whitefish	26.4	200									
mountain Whitefish	26.5	190									
mountain Whitefish	28.2	230									
mountain Whitefish	29.7	250									
mountain Whitefish	26.2	180									
mountain Whitefish	26.5	200									

Heather Lake



Lake: **HEATHER**

PHOTOGRAPH DIRECTORY

Negative #	Plate #	Description
R2:15A	1	Downstream view from beaver dam #1, located approx. 270 m upstream from lake on inlet.
R2:18A	2	Upstream view of beaver dam at inlet of unnamed lake #1, located 840 m upstream from Heather Lake.
R2:6A	3	Downstream view of an old beaver dam at lake outlet, taken from lake shore. This dam is not a barrier to fish passage.
R2:7A	4	Upstream view of sample site #1 on outlet, taken approx. 50 m downstream from lake.
R2:8A	5	Downstream view of sample site #1 on outlet, taken approx. 50 m downstream from lake.
R2:9A	6	View of substrate at sample site #1 on outlet, taken approx. 50 m downstream from lake.
R2:11A	7	Downstream view of sample site #2 on outlet, taken approx. 150 m downstream from lake.
R2:10A	8	Upstream view of sample site #2 on outlet, taken approx. 150 m downstream from lake.
R2:13A	9	View of substrate at sample site #2 on outlet, taken approx. 150 m downstream from lake.

Plate 1: Downstream view from beaver dam #1, located approx. 270 m upstream from lake on inlet.

Plate 2: Upstream view of beaver dam at inlet of unnamed lake #1, located 840 m upstream from Heather Lake.

Lake: **HEATHER**

Plate 3: Downstream view of an old beaver dam at lake outlet, taken from lake shore. This dam is not a barrier to fish passage.

Plate 4: Upstream view of sample site #1 on outlet, taken approx. 50 m downstream from lake.

Plate 5: Downstream view of sample site #1 on outlet, taken approx. 50 m downstream from lake.

Plate 6: View of substrate at sample site #1 on outlet, taken approx. 50 m downstream from lake.

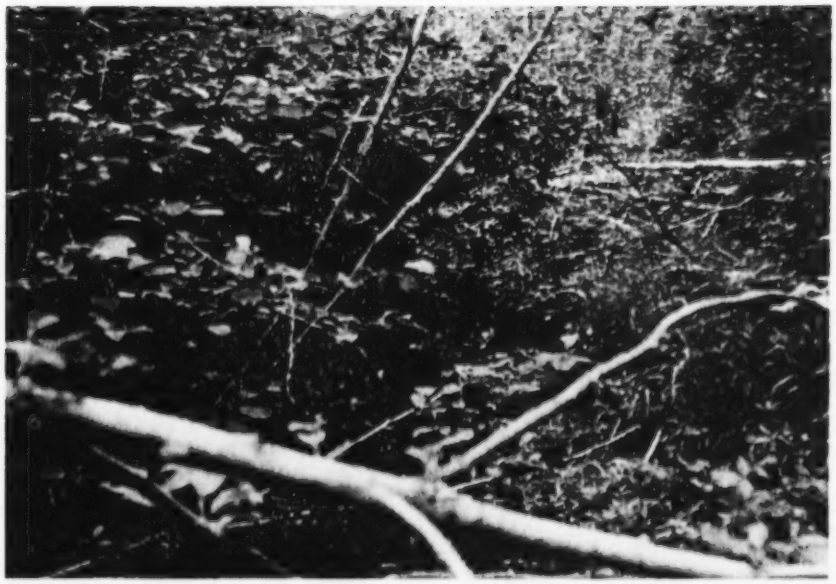


Plate 7: Downstream view of sample site #2 on outlet, taken approx. 150 m downstream from lake.

Plate 8: Upstream view of sample site #2 on outlet, taken approx. 150 m downstream from lake.

Plate 9: View of substrate at sample site #2 on outlet, taken approx. 150 m downstream from lake.

Appendix B

TRIBUTARY STREAM DATA

Lake: **HEATHER**

System Name: **Unnamed C.** **outlet**

System No.: –

Site Location: Sample Site #1, approx. 50 m downstream from lake.

Date:	June 13, 1989	Time:	– hrs
Channel Width:	2.60 m	Water Temp.:	20 °C
Wetted Width:	1.64m	Stage (flow)	moderate to high
Max. Depth:	27.5 cm	Velocity:	0.3 m/sec
Avg. Depth:	22.0 cm	Field Gradient:	1 %
Turbidity:	27.5 cm	Colour:	gin clear

Flood Signs:

Height:	35 cm
Type:	bank erosion

Substrate Breakdown:

Fines	Small Gravel	**Large** Gravel	Cobble
80 %	20 %	-- %	-- %

Boulder	Bedrock
--%	-- %

Substrate Compaction: **low** Sand: -- %

Banks:

	Form	Height	Stability
Right	repose	0.15 m	moderate due to rooted vegetation.
Left	straight/undercut	0.50 m	low to moderate due to rooted vegetation.

Comments:

Occasional patch of gravel available, however, a high percentage of fines mixed in. Fair to moderate rearing habitat noted (undercut banks, LOD).
One pair of suckers was observed 30-40 m downstream of sample site.

Lake: **HEATHER**

System Name: **Unnamed C.** **outlet**

System No.:

Site Location:	Sample Site #2, approx. 150 m downstream from lake.		
Date:	June 13, 1989	Time:	-- hrs
Channel Width:	6.2 m	Water Temp.:	20 °C
Wetted Width:	4.4 m	Stage (flow)	moderate
Max. Depth:	11.0 cm	Velocity:	0.5 m/sec
Avg. Depth:	6.0 cm	Field Gradient:	2.5 %
Turbidity:	11.0 cm	Colour:	slightly tannic

Flood Signs:

Height: 50 cm

Type: large organic debris

Substrate Breakdown:

Fines	Small Gravel	Large Gravel	Cobble
10 %	35 %	35 %	20 %

Boulder	Bedrock
-- %	-- %

Substrate Compaction: moderate Sand:

Banks:

	Form	Height	Stability
Right	vertical	1.0 m	high due to rooted vegetation.
Left	repose	0.5 m	high due to rooted vegetation.

Comments:

Moderate to good spawning habitat.
Some rearing habitat observed (pools, undercut banks, LOD, overstream cover).
Site location is a riffle.